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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/540,867

06/27/2005

Ken Nishimura

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EXAMINER

SUITTE, BRYANT P

ART UNIT

PAPER NUMBER

1795

MAIL DATE

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12/30/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/540,867	<b>Applicant(s)</b> NISHIMURA ET AL.	
	<b>Examiner</b> BRYANT SUITTE	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 5,6 and 36-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/17/08, 6/24/08, 6/27/05</u> .                               | 6) <input type="checkbox"/> Other: _____                          |

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**ELECTROCHEMICAL DEVICE AND METHOD FOR MANUFACTURING SAME**

Examiner: Suitte

10/540,867

December 4, 2008

***Election/Restrictions***

1. Applicant's election without traverse of Group I claims 1-4 and 7-36 is acknowledged. Claims 5, 6, and 36-50 in the reply filed July 31, 2008 on are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 7-16, 20 and 24-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyman (US 5,567,544) in view of Dudley (US 2002/0197535).

Regarding claim 1, Lyman discloses a battery (electrochemical device) comprising an electrode assembly. The electrode assembly comprise a cathode (22) (first electrode), anode (24) (second electrode), a separator (23) disposed between the two electrodes. The cathode comprises a substrate (26) a nickel current collector (28) attached to substrate and a cathode reagent layer (30) (electrode mixture layer). The anode comprises a substrate (32) a nickel current collector (34) and an anode reagent layer (36) (electrode mixture). The cathode comprises a current collector composed of

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nickel (conductive layer). See figure 1 and column 4 lines 40-67. However the current collector does not comprise an insulating area per se.

Dudley discloses a battery stack composition comprising a current collector that is coated with an edge material (insulating area) that provides an insulating barrier between the current collector and the other components of the battery. See paragraphs 103-106 and figure 6c. therefore, it would have been obvious to one having ordinary skill in the art to utilize the edge material disclosed by Dudley with the battery composition of Lyman because Dudley discloses that the edge material can participate in the battery as a barrier to protect against air, light and water, provide a barrier between the current collector and the other components and act as an electrical insulator. See paragraphs 96 and 106.

Regarding claim 2, Lyman discloses a battery comprising a pin (60) (first and second terminal) that is electrically connected to the conductive sheets (58) (current collectors) of the cathode and anode. See figure 5. The pins (60) reside on the upper and lower faceplates (54, 56) (first face and second face). See figure 5. The electrode assembly comprises conductive sheets (58) for the cathode and anode and an insulating area (52) that are connected to the pins (60). The insulating layer (52) faces the upper and lower faceplates (54, 56) of the cathode and anode respectively. See figure 5.

Regarding claim 3, Lyman discloses the upper and lower faceplates are positioned on opposites sides the electrode assembly. See figure 5.

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Regarding claim 4, Lyman disclose an insulating layer (52) that is divided into four sections that allow for the electrode assemblies to fit into. See figure 5. The insulating layer keeps the cathode and anode separated from one another. See figure 5.

Regarding claims 7 and 8, Lyman discloses a battery comprising a current collector with a conductive area and insulating area that does not contact the electrode mixture layer. See figure 2. The pins (180) (first and second terminal) are buried in the cathode and anode, which comprise conductive and insulating layers, at the top (edge) or bottom (edge) of the electrode assembly. See figure 12.

Regarding claims 9 and 10, Lyman discloses a battery comprising an electrode plate assembly comprising a third and fourth side face (158). See figure 12. The edges of the electrode plate assembly comprising the cathode and anode (162, 166) which comprise the current collector of the cathode and anode are aligned flush with one another on all four sides of the electrode plate assembly. See figure 12. The current collectors of the cathode and anode and the separator are layered upon each other. Therefore, each current collector of the cathode and anode and the separator comprise the same area, thereby satisfying the relations. See figure 12.

Regarding claim 11, Lyman discloses a battery comprising a pin (60) (first and second terminal) that is electrically connected to the conductive sheets (58) (current collectors) of the cathode and anode. See figure 5. The pins (60) reside on the upper and lower faceplates (54, 56) (first face and second face). See figure 5. The electrode assembly comprises conductive sheets (58) for the cathode and anode and an

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insulating area (52) that are connected to the pins (60). The insulating layer (52) faces the upper and lower faceplates (54, 56) of the cathode and anode respectively. See figure 5. The cathode and anode layers (162, 166) edges are covered with a boundary layer and separator (160 and 164) (insulating material). See figure 12.

Regarding claim 12, Lyman discloses that the battery comprises an electrode assembly with a separator (164) (insulating material) that faces the second face of the cathode (166) (first electrode mixture layer) and the first face of the anode (162) (second electrode mixture layer). See figure 12.

Regarding claim 13, Lyman discloses the cathode and anode comprise a fiber glass, Teflon (insulating material) utilized as the substrate layer (26, 32) (carrier layer) with current collectors attached to the substrates (28, 34). The current collectors (28, 34), comprising the conductive layer, are adjacent to the edge of the cathode and anode mixture layer. See column 4 lines 35-65 and see figures 1 and 2.

Regarding claim 14, Lyman discloses a battery comprising a pin (60) (first and second terminal) that is electrically connected to the conductive sheets (58) (current collectors) of the cathode and anode. See figure 5. The pins (60) reside on the upper and lower faceplates (54, 56) (first face and second face). See figure 5. The electrode assembly comprises conductive sheets (58) for the cathode and anode and an insulating area (52) that are connected to the pins (60). The insulating layer (52) faces the upper and lower faceplates (54, 56) of the cathode and anode respectively. See figure 5. The battery panel (48) of the case contacts the side of cathode and anode (first and second side face). See figure 7.

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Regarding claim 15, Lyman discloses a case that comprises a battery panel (48) (flame) that surrounds the electrode plate assembly and is in contact with the cathode and anode side faces. See figure 7. The upper and lower face plates (54, 56) (two flat sheets) cover the top and bottom of the battery panel (48) (flame) and are in contact with the upper and lower faces of the electrode assembly. See figures 5 and 7.

Regarding claim 16, Lyman discloses a case that comprises a bottom and top panel that comprises the electrode plate assembly. See figure 7. The battery panel (48) (side walls) that is in contact with the cathode and anode side faces. See figure 7. The upper and lower faceplates (top and bottom of the case) (flat sheets) are in contact with the upper and lower faces of electrode assembly. See figures 5 and 7.

Regarding claim 20, Lyman discloses a battery comprising pins (60) that supply the path for electrical feed-through of the battery. See column 6 lines 48-50. By definition of a metal is a chemical element whose atoms readily lose electrons (electrical feed) to form positive cations, and form metallic bonds between other metal atoms (metal particles joined continuously) which is a lattice (porous metal film) of positive ions surrounded by a cloud of delocalized electrons. See website <http://en.wikipedia.org/wiki/Metals>.

Regarding claim 21, Lyman discloses a battery comprising terminals that are connected to the cathode and anode of the battery. Each electrode structure is configured to comprise substrate, current collector layer composed of a metal (conductive material) (e.g. nickel) which is a reagent layer composed of a metal hydride (e.g. Nickel Hydroxide). See column 6 lines 64-67 and column 7 lines 1-10. The nickel

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hydroxide is chemical impregnated to form the reagent layer. The chemical impregnation process comprises Nickel Hydroxide, Cobalt-Nitrate and Nickel-Nitrate solution (paste). The Cobalt-Nitrate and Nickel-Nitrate solution formulate the resin and Nickel is the conductive material dispersed in the resin. By definition a resin is a material that forms a hard film on the surface after the chemicals have evaporated. See <http://www.burrsununfinishedfurniture.com/FAQ/glossary-of-wood-finishing-terms.htm>.

The cathode is in the order of two thousandths of an inch; therefore it would have been obvious to one having ordinary skill in the art that the conductive material (nickel) utilized in the construction of the electrodes has to be fine particles to be located on the cathode structure. See column 7 lines 1-44.

Regarding claim 24, Lyman discloses a battery comprising a current collector of the outside electrodes comprises a conductive are on both sides and the electrode mixture layer is located adjacent to the inner electrode. The conductive area is electrically connected to first terminal and provides electrical through flow throughout the battery. See figure 5.

Regarding claim 25, Lyman discloses a battery comprising a layer (52) that is electrically insulating material, polypropylene (porous), that isolates each of the cells (46) from each other. See column 6 lines 30-40 and figure 5. The insulating layer (52) surrounds the sides of the cells (46) (third and fourth side). See figure 5.

Regarding claim 26, Lyman discloses an electrically insulating material, polypropylene, (polyolefin as evidence by paragraph 691 in US 2002/0050287). See column 6 lines 30-40.



Regarding claim 27, Lyman discloses an insulating layer (52) (film shaped). See column 6 lines 30-40. By definition film is a thin layer of a substance. See website <http://en.wiktionary.org/wiki/film>.

Regarding claims 28 and 29, Lyman discloses a battery comprising a layer (52) that is insulating material that isolates each of the cells (46) from each other. See figure 5. The part of the insulating layer (52) that isolates each of the cells from each other is a separator on the face of the electrode plate assembly covered with the insulating porous material. See figure 5.

Regarding claim 30, Lyman discloses a battery comprising a layer (52) that is electrically insulating material, polypropylene (porous). See column 6 lines 30-40 and figure 5. An electrically insulating epoxy (resin) is applied the insulating layer (52). See column 9 lines 15-25.

Regarding claim 31, It is noted that claim 31 is product-by-process claim. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Since Lyman's battery is similar to that of the Applicant's, Applicant's process is not given patentable weight in this claim.

Regarding claim 32, Lyman discloses an electrically insulating material, polypropylene. See column 6 lines 30-40.

Regarding claim 33, It is noted that claim 33 is product-by-process claim. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Since Lyman's battery is similar to that of the Applicant's, Applicant's process is not given patentable weight in this claim.

Regarding claims 34, 35 and 36, Lyman discloses a battery comprising an insulating layer comprised of polypropylene (insulating base material) and epoxy (insulating adhesive) applied to the insulating layer. See column 9 lines 15-25.

4. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyman (US 5,567,544) and Dudley (US 2002/0197535) as applied to claims 1-4, 7-16, 20 and 22-36 above, and further in view of Kim (US 2003/0198867).

Regarding claims 17, 18 and 19, Lyman discloses a battery comprising pins (180) (first and second terminal) that are extended through an opening (slit) in the top (walls) of the case. See figure 12. However, Lyman does not disclose that the terminal comprises a lead piece that is connected to the pins (180).

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Kim discloses a connecting terminal (100) (lead piece) for a storage battery. See abstract and figure 2. Therefore, it would have been obvious to one having ordinary skill in the art to utilize the connecting terminal with the battery of Lyman because Kim discloses the terminal can prevent the occurrence of cracks and defective disconnections of said connecting terminal caused by mechanical vibration. See paragraph 2.

Furthermore, Lyman discloses the claimed invention except for a slit provided through the frame of the said case. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an opening (slit) in the battery panel (154) (frame), since it has been held that change of shape of parts of an invention involves only routine skill in the art. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Regarding claim 23, Lyman, Dudley and Kim discloses a protrusion (terminal) that is electrically connected (welded) to a connecting terminal (100) (lead) the battery. See figure 1.

5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lyman (US 5,567,544), Dudley (US 2002/0197535) and Kim (US 2003/0198867) as applied to claims 1-4, 7-16, 20 and 24-36 above, and further in view of Ching Jr. et al. (US 5,599,641).

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Regarding claims 22, Lyman, Dudley and Kim disclose a battery comprising a lead, however, Lyman does not disclose a terminal comprising a low melting point metal.

Ching discloses a battery terminal (62) comprising a lead alloy of antimony/tin/lead (low melting-point metal having a metal point of 250<sup>0</sup>C of lower). See column 5 lines 57-67. Therefore, it would have been obvious to one having ordinary skill in the art to utilize the lead alloy as the terminal of the battery of Lyman and Kim because Ching discloses the lead alloy provides a good wear resistance and hardness for the terminal comprising the lead alloy composition. See column 5 lines 58-59.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRYANT SUITTE whose telephone number is (571)270-3961. The examiner can normally be reached on Mon-Fri 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRYANT SUITTE/  
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1795